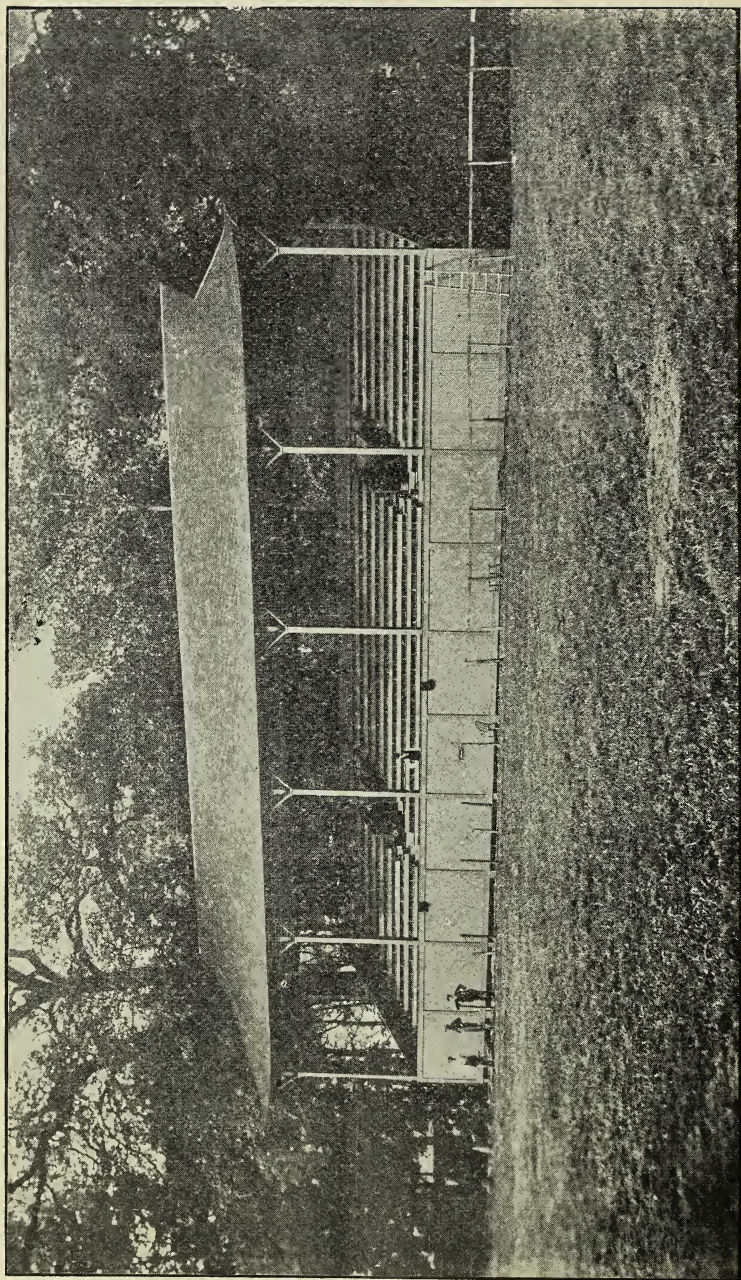


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The New Athletic Grand Stand

THE AGRICULTURAL STUDENT.

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EDITORIAL CHAT.

Standing upon the threshold of a new century we find ourselves wondering whether the advancement along agricultural lines will be as great in the coming century as it has been in the last hundred years. Along many lines the improvement has been carried so far as to leave little to be desired in that direction, but on the other hand there are some matters of vital interest to the agricultural classes that have not received the proper amount of attention. The subject of road making occupies a prominent place in the latter category, and it is to this subject that we wish to call attention.

Every farmer is more or less dependent upon the country roads for the marketing of his crops, and with many this matter of transportation is an important item of expense, much more important than is usually realized by the average farmer.

Some time ago the national government began collecting statistics on this subject, and the following figures are given out as the result of this disinterested investigation:

The total wagon transportation of the United States is 500,000,000 tons



per year for an average distance of eight miles. The average cost of hauling a ton eight miles is \$2, which makes the total cost of wagon transportation in this country \$1,000,000,000 per year.

As compared with other countries the American farmer is paying more than twice as much for such transportation. In England and the other countries of Europe the average cost of hauling one ton eight miles is eighty cents. This cheaper cost in these countries is due, to a large extent, to better highways and the universal use of wide tires. From these statistics it will be seen that we are actually sinking something like \$600,000,000 per year into the mud of our country roads, and to just this extent we are handicapped in the markets of the world.

The coming century is destined to see a change in this condition of affairs, and we believe that even now there is at work a factor which will play an important part in the solution of the transportation problem. We refer to the trolley lines that are so rapidly extending their lines into the country and bringing the farmer into close communication with the consumers of his products. In a few years this trolley system will be so perfected as to be able to move freight with the same facility and cheapness with which it now handles passengers. It will then be necessary only to construct short roads to the nearest trolley line and the problem of transportation is in a measure solved. Owing to their limited length these roads could be constructed in the best possible manner and kept in such repair that the cost of hauling over them would be reduced to a minimum.

We have tried to indicate in a general way what we believe to be a solution of the problem. The details of the scheme remain to be worked out from

time to time as the trolley system develops and reaches farther and farther out into the country.

Our frontispiece this month shows our new athletic ground and stand which has been completed since the opening of the present football season. And it is gratifying to note in this connection that we have a winning foot-ball team, one that has been beaten but once in two seasons. The College of Agriculture is represented on the team this year by Messrs. Segrist and Breese, both of whom have done their full share toward winning laurels for the Scarlet and Gray. The following is the record in detail:

OHIO STATE, 23; OPPONENTS, 21.		
1899.		
Ohio State....	30; Otterbein	0
Ohio State....	29; Wittenberg ..	0
Ohio State....	5; Case ..	5
Ohio State....	41; Ohio ..	0
Ohio State....	6; Oberlin	0
Ohio State....	17; Marietta ..	0
Ohio State....	12; O. M. U.....	0
Ohio State....	34; Muskingum ..	0
	185	5
1900.		
Ohio State....	20; Otterbein . .	0
Ohio State....	20; Ohio ..	0
Ohio State....	27; Cincinnati . .	0
Ohio State....	47; O. W. U.....	0
Ohio State....	17; Oberlin ..	0
Ohio State....	27; West Va. . .	0
Ohio State....	24; Case ...	10
Ohio State....	6; O. M. U.....	11
Ohio State....	0; U. of M.....	
	188	
Grand total	373	21

The first number of the *O. S. U. Naturalist* made its appearance a short time ago. It is to be the monthly official organ of the Biological Club and will print such articles, on the natural history of the State, as have no other convenient avenue of publication. Professor Schaffner is editor-in-chief.

Farmers' Institutes.

The Ohio State Board of Agriculture has recently issued a bulletin of information in regard to the farmers' institutes to be held during the coming winter under its auspices. Two hundred and sixty institutes will be held in the eighty-eight counties of the State, the number to be held in each county depending upon the number of inhabitants, as the law limits the counties to an expenditure of not more than three mills per capita for the purpose of holding such meetings. Every county, however, will be allowed at least two institutes, while the larger counties will be limited to four. The State Board furnishes a paid lecturer, for each of these meetings, who is prepared to occupy at least half of the time of each session in lecturing upon some subject previously determined upon. The Board urges the establishment of independent institutes where they are unable to send their paid lecturers.

The professors of the University have been excused from regular institute work, so that they might respond to calls from these independent institutes.

Professors Hunt, Gibbs and Decker will spend many of their Fridays and Saturdays during the winter lecturing at independent meetings in the central part of the State. Dr. Thompson will lecture before a number of institutes, and J. Warren Smith, section director of the Weather Bureau, will respond to calls whenever the duties of his position will permit.

The State Farmers' Institute will be held in Columbus on January 15 and 16, and the Breeders' and other associations will hold their annual meetings on the evening of the 15th. No other institutes will be held in the State during the week of the Columbus meeting.

The Ohio Dairy School.

The Ohio Dairy School will open January 2 with more students than ever before in its history. The largest attendance heretofore was 29 special students, and at the rate that they are now registering this number will very likely be doubled. The registration, November 22, stands 37, and about thirty-five letters of inquiry have been answered in the past two weeks, the majority of which are yet to be heard from.

Eight States are represented on the list, Massachusetts, New York, Pennsylvania, Ohio, Kentucky, Indiana, Illinois, or a solid block of States from the Atlantic Ocean to the Mississippi River, and also Colorado. Twenty-seven of these prospective students are from Ohio and ten from other States. Surely the fame of Ohio is going abroad.

In addition to this class of special dairy students there will be about twenty-five regular agricultural students taking the work.

There is certainly a field in dairying for progressive young men who are trying to decide what business to follow.

Last year's class of special students numbered twenty-three. Fully half of these had positions to which they expected to return.

Applications have been received by Prof. Decker since last January for forty-five dairymen in different capacities. Two men in the last class, without previous experience, have been successfully filling positions since the close of the school last March, at thirty-five dollars per month.

A number of calls have been made for *thoroughly competent men* with the price a secondary matter.

It is the policy of those in charge of the school not to promise positions to

prospective students nor to recommend anyone they do not feel confident can fill the position offered. One can well imagine the difficulty of filling forty-five positions with a dozen men. Men *with previous experience* and a *dairy school training* are especially in demand, and this demand will increase.

American Agricultural Colleges and Experiment Stations.

The Fourteenth Annual Convention of the Association of American Agricultural Colleges and Experiment Stations convened in North Sheffield Hall, Sheffield Scientific School, Yale University, New Haven, Conn., Tuesday, November 13th, and held a three days' session. The morning and afternoon session of Wednesday, however, was held at Wesleyan University, in Middletown. The meeting at Middletown was the occasion of celebrating the twenty-fifth anniversary of the first establishment of an American Agricultural Experiment Station, which was established in October, 1875, in Judd Hall, Wesleyan University, with Dr. W. O. Atwater, Director. It is of interest to note, also, in passing that this was the fiftieth anniversary of the establishment of the first German Experiment Station.

Morning and evening sessions of each day were devoted to general sessions, and the afternoons of each day were devoted to sectional meetings. The sections on Horticulture and Botany, on Entomology, on Mechanic Arts, on Agricultural Chemistry, and on College Work, held meetings in the afternoon at which papers of special interest to the several sections were presented.

There were presented to the Association a series of three addresses by Dr. Bernard Dyer of London, England, representing the Sir John Lawes

Trust Fund on "Experimentation at Rothamsted." Dr. Dyer had just arrived from England for the purpose of delivering these addresses.

The most notable addresses delivered before the general Association were by the President of the Association, Joseph E. Stubbs, President of the Nevada State University, on "Ethical Values Fundamental in the Ideas and Ideals of Modern Education"; by Whitman H. Jordan, Director of the New York State Experiment Station, on "American Experiment Stations"; by George W. Atherton, President Pennsylvania State College, "Memorial Address on Justin S. Morrill."

On Thursday, President Hadley of Yale University, appeared before the Association in a brief address.

The business of the Association was largely taken up with listening to the reports of various committees, which had been appointed at previous meetings, to prepare such reports.

The Association listened to the reports of the following committees: On nomenclature; on uniform fertilizer laws; on engineering experiment station; on collective station exhibit at Paris Exposition; on graduate study at Washington; on co-operative work between stations and departments; on indexing agricultural literature; on revising the constitution; on military instruction in land grant colleges; on method of teaching agriculture; on pure food congress.

The committee on graduate study at Washington expressed its approval of the action of the Secretary of Agriculture in the matter of the appointment of student scientific aids, recommended the extension of graduate study within the Department, and also suggested the co-operation where found advisable with other departments of the general government.

The Association voted that the col-

lective station exhibit at the Paris Exposition should be installed at the Pan-American Exposition at Buffalo, with such changes or additions as might seem wise, to Dr. True of the Office of Experiment Stations at Washington.

The executive committee was also empowered to appoint a person to co-operate in the dairy test at the Pan-American Exposition.

Committee of conference on principles of breeding was appointed as follows: Hays of Minnesota, Hunt of Ohio, Bailey of New York, Armsby of Pennsylvania, and Brigham of Rhode Island.

Resolutions were adopted in memory of Sir John Bennett Lawes, President James H. Smart, and President George E. Morrow.

President W. O. Thompson of the Ohio State University presented to the Association the proposition of the Board of Trustees of the Ohio State University to establish a graduate summer school in agriculture, beginning in 1902. The subject was favorably received by the convention.

The following officers were elected:

President—A. W. Harris, President of the University of Maine, Orono, Me.

Secretary - Treasurer — Edward B. Voohees, Director Experiment Station, New Brunswick, N. J.

Executive Committee—Henry H. Goodell, President Massachusetts Agricultural College, Amherst, Mass.; Joseph E. Stubbs, President of Nevada State University, Reno, Nevada; Alexic Cope, Secretary of the Ohio State University, Columbus, Ohio; H. C. White, President of Georgia State College, Athens, Ga.; George W. Atherton, President of Pennsylvania State College, State College, Pa.

Bibliographer—A. C. True, Director of the Office of Experiment Stations, U. S. Department of Agriculture, Washington, D. C.

Agricultural Education.

“Not many generations ago where you now sit, circled by all that exalts and embellishes civilized life, the rank thistle nodded in the wind, and the wild fox dug his hole unscared.”

The ground was first turned in what is now the great State of Ohio, a little more than a century ago. To those hardy pioneers who carved out of the wilderness of the Northwest territory this great state of ours, all honor is due. I fear that few of us who belong to the younger generations are capable of realizing the trials and sufferings of those hardy New England settlers who at that early day began to feel crowded in their seaboard settlements, and impelled by the Anglo-Saxon desire to conquer and progress, pushed into the fertile valleys of the Ohio and its tributaries, and there laid the foundations for future greatness and happiness. The dense forest had first to be cleared away and then the virgin soil of the first small patch stirred with a hoe or a rude wooden-bottomed plow. Our forefathers did not have the improved farm implements which we now possess to aid them in taming the wilderness and bringing forth the hidden wealth in the soil that Mother Nature had been storing up for untold centuries.

Truly it may be said that “in the sweat of their brow,” they ate their bread. But with all their hard labor they escaped many perplexing problems which confront the farmer of today. It was only necessary for them to prepare the soil, sow the seed and have faith in Providence to provide a harvest. Each little settlement was a unit within itself. The old water wheel mill prepared the grain of all for bread. The good housewife prepared the garments for the family from the wool of the little flock of sheep which the settler kept, or from

the flax which he raised in his clearing. For winter they wore boots and shoes of their own making. It made no difference to them what the rest of the world was doing, as the success of each family depended entirely upon its own industry.

But now all is changed. The world of today is different from the world of yesterday, just as tomorrow will have advanced beyond today.

With the advent of improved machinery and the application of steam and electricity to transportation, and the telegraph to communication, there has come a division of labor, and no one class is entirely independent of the other. With this increased complexity of human life there has come a great need for a higher education of the farmer's boy and girl, in order to enable them to compete successfully in the struggle for existence. The old saying that "any fool can farm" has long since become a tradition of the past. The farmer points with pride to the great men of the nineteenth century, and tells you that they were brought up on the farm. Washington, Jefferson, Adams and so on down the list to Garfield and Sherman, were country boys who got an education; but the time has come when the country boy who follows his father on the farm must get an education as well as his brother who becomes a great statesman, lawyer or a doctor.

Why is it that the agricultural brain, the parent brain of the nation, furnishing the brightest intellects in statesmanship, commerce, law and art, should remain itself the least cultivated.

The farmer of the past gave himself up too closely to a mere physical struggle for existence. There was a development of muscle at the expense of mind. This condition of affairs was but a logical result of the conditions which the early farmer had to meet. It required

muscle, not brain, to clear the land. The great trouble is that many farmers are too slow in letting go of this conception of an agricultural training. The early farmer trained his boy to work and not to think, and, alas, many present day farmers believe that they have discharged the duty of father to son when they have taught him how to work. Did you ever ask yourself the question: How has the American farmer been trained and how is he training his boys to be farmers? I want to say to you that there is a crying need for trained thinking in American farming. Farmers as a class lack business methods in the conduct of their own affairs. In proof of this I need only point to the discontent that one meets with everywhere among unsuccessful farmers.

Too many of our farmers believe that the education to be derived from attending the district school during the winter, and perhaps a few months in the township high school is all that is necessary to fit John as a farmer. Henry expects to become a doctor and he is sent to the most scientific school of the profession, there to fit himself for his chosen work.

William desires to become a lawyer, and in order that he may become a leader in his chosen profession he is educated at the best law school in the land. He is taught the principles underlying his vocation and his mind is directed into those channels which develop judgment and a keen intellect.

But the farmer thinks that it is not necessary that John, who is to remain on the farm, should broaden and strengthen his mind. He can see no need of a knowledge of the intricate mysteries of plant and animal life. The other boys become professional men with sharp intellects and a keen foresight. The successful professional men came from the farm, but their training has

been more thorough than that of plain, plodding John. They control the forces of society. They may be found in Congress and in the State Legislative halls. Because of their superior mental training they make the laws of the land, disregarding in many instances the best interests of the farmer.

The old idea that there are no fundamental principles in agriculture is a mistaken one. And let one say to you that the farmer's boy who is permitted and encouraged to discern the principles of his calling on the printed page and then go out into the field, the orchard, or among the birds, and put those principles into practice, is the one that is going to succeed in the future. The educated farmer is not a fanciful dream, but a present reality.

There are many men who I know to be successful farmers and stock breeders. Perhaps very few of them are college graduates, because they had not the opportunity, but they are educated farmers nevertheless, although they may sneer at book farming.

How do I know they are educated? Why, because they are successful, and in these days of sharp competition and close margins only an educated man can succeed. They derived their education from a lifetime's attendance at the school of experience. My plea with you, brother farmers, is that you do not compel your sons who stay on the farm, to pursue the costly and lengthy course in this school of personal experience which you have been compelled to take. Give them those advantages which are to be derived from the experiences of others. Train them to think and to act intelligently. Why, you have seen the day, if you are not too young, when it was sufficient if you knew the condition of the market in your market town. Today the farmers must buy and sell in the markets of the world. The condi-

tions of the wheat crop in Russia, India or Australia affects the price of wheat in Chicago, and the price of wheat in Chicago governs the price in your local markets. The same conditions prevail in wool, cattle and pork. The influences which affect the American farmer of today are world-wide, and he is today exerting a world-wide influence of his own. How much more necessary is it, then, that the boy who is to take his place on the farm should receive the very best possible training in order that he may be a successful farmer and an ornament to his profession. Nay, more than that, above the duties of your profession must be placed at all times the obligations of American citizenship.

The farmers of this country have permitted other men to do their thinking for them on those questions touching social and economic life. It is time that the farmer was doing a little investigation of his own along the line of political economy, and thanks to the educating influence of our state institutions and the Grange there can be no doubt that the ultimate result will redound to the honor and glory of the American farmer.

But now a word as to the sources of training in scientific agriculture. The earliest education of the farmer's boy should begin at home. Are you interested in the beauties of Nature? No other class of men lives so close to nature as the farmer. I pity the man who can not spare the time from his daily toil to sit down in the shade of a tree and give a few moments to a contemplation of the marvelous changes that are going on about him. Teach the boy by example to be observing of the things about him. Nowhere can the loving care of an all-wise Creator be better illustrated than on the farm with its seed-time and harvest.

I know that in every community there are men who recognize the advantages

of a higher training in agriculture, but the great mass of the farmers despise knowledge and condemn study and research. They do not believe that there is such a thing as a science of agriculture. They do not believe that a knowledge that will enable them to farm better can be taught out of books.

Look at the courses of study to be found in the farmers' schools, the country district. They reflect with the faithfulness of a mirror the character and thought of the farmers who support them. If the mass of the farmers do not believe in scientific agriculture, then why is it that there is not some simple text book dealing with a few of the principles of agriculture to be found in the farmers' schools?

How many of the farmers who read this article ever heard of the meaning of nitrogen phosphoric acid, or potash and their relations to plant life in their schoolboy days. If they had we would not today be treated to the spectacle of thousands of acres of abandoned farm lands in the New England States, or of the hundreds of farmers of Ohio who are barely able to eke out an existence from their impoverished lands. I trust that the day is not far distant when every district school will be provided with a rudimentary text book on agricultural science, and a teacher capable of interesting his pupils in its pages.

Having given the boy a taste of the possibilities for pleasure and enjoyment to be derived from an investigation of a few of the simple principles of agriculture then encourage him to go on and complete his education at that modern institution for agricultural improvement—the Agricultural College. Here he may study chemistry and its relations to soil fertility, and plant and animal growth. Botany, too, has its place in a study of the economic relations of plant to animal life. The soil, its im-

provement by various methods of tillage and rotation of crops will claim its due share of his attention. The composition of the animal body and its repair by proper nutrition; the making of meat and milk by proper feeding of the proper feeds in their right proportions will receive a good share of his attention. The principles of stock herding, the laws of inheritance, the influence of natural selection, the possibilities of cross breeding and cross fertilization will all stimulate him to a desire for more knowledge that he may better himself and humanity.

And then there follows Geology, with its investigations of the hidden wealth of the earth; and zoology and its special work along the economic lines of insect life and its relation to agriculture.

Nor is that all. Ever mindful of the fact that the boy must make a man and the man a citizen, provision has been made for the instruction of the agricultural student in social and economic questions of importance. He is taught the economic importance of wealth, capital and labor and their relation to each other. And so I might go on and enumerate the many things that claim their share of the attention of the agricultural student.

The advantages gained by the student of agriculture are not all obtained in the class room. To the social life of the college he has come to be regarded as on an equal footing with the student in any other profession. It is a source of great pleasure to me to see the agricultural students of our own State University occupying positions of the highest honor in the gift of the student body.

The farmers of Ohio have spent \$100,000 in a building and equipping a building for special instruction in the science of agriculture. You are spend-

ing \$300,000 every year in supporting a State University. It is yours. It was established primarily in the interests of Agriculture and the Mechanic Arts. You are maintaining there a corps of men second to none in the United States as instructors in their chosen work. They are laboring earnestly and untiringly for the advancement of Ohio agriculture, and yet what use are the farmers of Ohio making of these advantages? It is estimated that there are 400,000 farmers' boys and girls in Ohio. There were less than 200 in attendance at the Agricultural College of the State University last year. To me the question is not: How can you afford to educate your boys to be scientific farmers, but how can you afford not to do it?

C. B. S.

Economy in the Purchase of Food.

It has been the experience of contractors employing large numbers of men that "the worth of a man depends largely upon the food he digests." It is also true that nearly half the income of wage-earners is spent for food, when equally nutritious food can be bought for half the money; but, notwithstanding the importance of the food question, people in general, and even house-keepers, know less of the uses and values of food, than of any other one thing of vital importance to them. When a woman pays a high price for a wrap trimmed with lace, she does not think that the money paid for the lace adds to the warmth of the wrap; but how comparatively few women know, when they buy oysters or expensive cuts of meat that they are indulging in luxuries which they often cannot afford, since the same food principles could be gotten from something else which would cost much less. Cheap cuts of beef contain all the nutriment of dear ones and can be made palatable

by proper cooking. Tough meat can be made tender by macerating with weak vinegar. Meat is made tender by the action upon the fibres of lactic acid which develops in the meat. The weak acetic acid has the same effect.

If a woman is to really economize in the matter of food for her family; that is, if she is to provide for them the kind and amount of food they need in palatable form with the least expenditure of money—she must take to the task as much knowledge, judgment and common-sense, must give to it as much attention and practice as a man must devote to carrying on his business successfully.

Besides merely buying wisely, a woman must care properly for the food purchased, cook it well, vary her menus, and the family must eat cheerfully what is set before them, practicing self-denial in the matter of over-fastidious tastes so that, being properly nourished at small expense, they may spend more money for books, pictures, education, dress, amusements, or whatever they may elect.

Most Americans, even those belonging to the laboring classes, eat more of certain kinds of food than they need, and this excess of matter to be disposed of by the system is very injurious to health.

Professor Atwater, of Wesleyan University, Middletown, Conn., in a series of very valuable investigations, extending over a number of years, into the diet of various classes of Americans has demonstrated that, as a rule, the laboring classes consume too much starch, sugar and fat, and too little protein. Such a diet is bad for men and women, but worse for children. Professor C. E. Wait, of the University of Tennessee, practically agrees with Professor Atwater. He says: "The people need more protein; that is, lean

meats, as beef, veal and chicken, fish like salt cod and mackerel and fresh fish, also oatmeal, beans, peas and other legumes, especially cow-peas. Milk is an economic food nearly everywhere except in Key West, where it sells for twenty cents per quart. Even skim-milk has all the protein and half the fuel value of whole milk and is, in most localities, the most economical source of animal protein.

The first requisite, in buying wisely is a knowledge of the needs of the human system; of what proteids, fats and carbohydrates will enable a given man to do his best work; of what are required to form good teeth and bones for a child. This requires study and cannot be set down in the compass of an article like this.

One of the objects of the National Columbian Household Economic Association, incorporated in March, 1893, is "To promote among members of the association a more scientific knowledge of the economic value of various foods." The women forming that association evidently recognized that they should know what articles of food contain the requisites, always bearing in mind that the saying, "The best is cheapest," does not apply at all to food. In fact the food value of articles has no relation whatever to their price, which depends rather upon the season, locality and similar conditions. To give only a suggestion of the proofs of this which might be cited. The price of eggs and chickens is double in Florida what it is in Texas, because no grain is raised in Florida and all chicken-feed has to be imported into that State. One of the farmers' bulletins issued by the U. S. Department of Agriculture contains the statement that, in America, a pound of cornmeal costs two cents and contains more nutriment than a pound of meat costing fifteen cents.

An American traveler in Germany some years ago paid eighteen cents for a pound of cornmeal, this high price being due to the fact that no corn is grown in Europe. Everyone knows that butter and eggs are cheaper in summer than in winter, and oranges and lemons much cheaper in winter than in summer.

People often say that, with the grocery and meat shop at the corner, they do not need a cellar; but, if a family is large, it will pay you to buy in quantity, and, even for small families, a month's groceries at least should be bought at a time. A good sized cold closet is needed for hanging meat, poultry, keeping butter, and various foods. Mrs. Parloa writes: "A hind-quarter of mutton may be bought for a family of three. A large amount of delicious broth, which will keep some time, may be made from the flank and thin ribs, as soon as the meat comes home. Several days later, fourteen chops, and some days later, a good roast may be gotten from the rest of the quarter. Soap may be made of the fat parts. Such a quarter weighs 20 pounds and would cost about a third what the soup-meat, chops and roast separately would cost."

"If poultry be drawn and a few pieces of charcoal be placed in the body, it will keep longer than if hung undrawn. It must not be washed until it is to be cooked. The dryer the meat is kept the better."

"Flour, if stored in a cool, sweet, dry place, will be as good, if not better, for bread-making if kept several months. All meals, however, are better when fresh. It is not economy to buy baker's bread with its usual high price and poor quality. Nothing probably pays better than homemade bread from the best western wheat.

Cereals and similar foods should al-

ways be kept in old glass jars, or earthenware vessels, or in tin. They deteriorate if kept in paper bags. English breakfast tea improves with age, while the lighter teas do not.

Most of the tuberous vegetables can be kept well, if one has an opportunity in the fall to buy a quantity cheap. Sweet potatoes, however, decay easily and should only be bought as needed.

Food should be cooked so as to keep as much nutrition and flavor as possible in the food. One can as well have juicy roasts as dry ones; this is accomplished by searing and frequent basting. Cooking should be done slowly over a moderate fire, rather than quickly over a very hot one. It was found by one experimenter that much of the flavor and not a little of the nutriment of Count Rumford's famous "soups" was lost if they were made hurriedly, instead of being cooked many hours, as was the practice of the originator.

The cook should also know the art of flavoring so as to make palatable, simple materials and left-overs such as soup-meat, which always contains most of the original nutriment.

The variation of the menu is an important item. The same things may be served in ways, the number of which depends solely upon the ingenuity of the housekeeper. One should learn to use every scrap of food to advantage in soups, salads, and croquettes. If a family is small, when one cooks a large piece of meat, she should consider its adaptability to being made over. Least can be done with pork. For making over, the most valuable are poultry, veal, lamb, mutton and beef. White meats are better for this purpose than red meats, and white, dry fish than the dark, oily kinds.

Cheese and bean dishes should occasionally be substituted for meat, since they contain the same kind of nutriment.

H. G. S.

Origin and Breeds of Dogs.

In the routine of his practice the veterinarian is often called upon to minister to the needs in disease of the everywhere present domestic animal, the dog. That he may perform this part of his work in a truly scientific and successful manner, it is not alone necessary that he be familiar with the various diseases which afflict this animal, and skilled in the application of remedies for their relief or cure, but he must as well be thoroughly acquainted with its life history, habits, and conditions of existence. To this end many of the most advanced and scholarly men in the veterinary profession have devoted much time and study; and, as this noble animal is the most widely distributed of all domesticated animals, and is the common friend of all mankind, a brief presentation of some of the leading facts concerning its origin, different breeds, and some of the striking characteristics of each, may not lack interest to the general reader.

The name, dog, may be regarded as common to several species of the family Canidæ, the distribution of which extends to nearly every part of the globe, but is especially applied to the one species—*canis familiaris*—to which all the domesticated dogs are usually considered as belonging.

The domestication of this animal can be traced to prehistoric times and consequently the question of its origin must remain largely a matter of conjecture. Prominent among the variety of existing opinions, is the one which regards all the present breeds as the offspring of a single wild source. More probable, perhaps, is the belief that they are the product of the blending of several distinct species. Many scientific considerations seem to support this latter belief and it may be sufficient to quote the world-renowned scientist,

Darwin, who, after careful study, concludes that "It is highly probable that the domestic dogs of the world have descended from two good species of wolves (*canis lupus* and *canis latrans*), and from two or three other doubtful species of wolves, namely, the European, Indian, and North African forms, from at least one or two South American canine species, from several races or species of the jackal, and perhaps from one or more extinct species."

Considering the above complex origin and taking into account the great length of time that dogs have been domesticated, the various uses for which they have been bred, and the great adaptability of this animal to crossing, even producing fertile offspring when crossed with other species, it is not surprising that the varieties now number into the hundreds. The great variations in size, shape, and disposition thus obtained, render an exact classification quite impossible. Among the various attempts at classification based on different considerations, the following, founded largely on certain anatomical characters, affords perhaps the nearest approach to a natural grouping, viz: Wolf-Dog, Greyhound, Spaniels, Hounds, Mastiffs, and Terriers.

The Wolf-Dog includes the semi-domesticated wolf-like dogs found throughout the northern regions of both hemispheres, and a prominent example is the Eskimo dog, which with its pointed muzzle, erect ears, and savage disposition, seems closely related to the wolf. The Newfoundland dog is regarded as belonging to this group, being probably descended from the native Indian dogs of the island crossed with certain English dogs taken there by early settlers. However, the Newfoundland and St. Bernard, which is also classed with this group, are considered by many as forming a separate group by themselves, differing widely in some of their physical

characters from the common type of wolf-dog. Perhaps the most prominent of this group is the sheep-dog found throughout Europe, and represented in Great Britain and America principally by the different breeds of collies.

The group of Greyhounds constitutes an old race, being in existence as such thousands of years ago. The race includes many varieties, among which may be mentioned the Irish Greyhound, the Scottish Deerhound, and the Old English Greyhound. These were powerful dogs of a wire-haired type, bred and trained to hunt the wolf and stag. The modern English breeds are less powerful animals of a smooth-haired type and unrivaled in speed and wind, these qualities having been cultivated at the expense of others. They have thus lost, in a great measure, their power of scent and are said to be the only dogs that hunt by sight alone. The Italian Greyhound is a well-known member of this group, being of a delicate breed and much prized as a house pet.

The Spaniel group is an important one, including some of the best types of modern hunting dogs. They are characterized by having large pendulous ears, a silky, shaggy coat and a very keen scent. The group includes various breeds, of which the following are the best known, viz: Common Spaniel, Water Dog and Setter of the larger varieties, and King Charles Spaniel, Blenheim Spaniel, and Maltese Dog of fancy varieties. These dogs are of the greatest use to the sportsman, being used in various ways and trained to perform remarkable service. They are readily taught to retrieve and display great sagacity in finding and recovering game that has been wounded and lost.

The interesting habit of crouching when game has been scented, which has been explained by Darwin as "merely the exaggerated pause of an animal about to spring on its prey," is a service-

able quality of the Setter and that from which he takes his name.

The Hounds include the following principal breeds, viz: The Bloodhound, Staghound, Foxhound, Harrier, Beagle, Pointer, and some other related breeds. They have long pendulous ears, close hair, and the most acute scent of any of the different breeds of dogs. This race of dogs are preëminently adapted to the chase, as they have been bred to possess the qualities of fine scent, fleetness, strength, and perseverance in the highest possible degree. The Pointer, classed with this group, is one of the best known of hunting dogs, and is so named from its habit of standing fixed at the scent of game, a quality similar to the crouching of the Setter and probably developed in the same way.

The Mastiff group includes breeds which are well known and of service as watch-dogs and as pets. It includes the Mastiff, the Bull-Dog and the Pug. The mastiffs belong to an old race of dogs which figured in history long before the Christian Era. They are noted for their great strength combined with a large degree of intelligence and an excellent disposition. They are mostly kept as watch-dogs, for the duties of which service, their sagacity and fidelity well fit them. The Bull-dog has the courage of the mastiff, but is not so large or strong and lacks the intelligence of the latter. It is perhaps at present bred mostly for show purposes. The Pug-dog, though possessing much of the appearance of the Bull-dog, is quite the reverse of the latter in disposition, being timid and good-natured and is much esteemed as a pet.

The Terriers comprise a class of small dogs which includes many varieties. Among the principal breeds may be mentioned the English Terrier, the Scotch Terrier, and the Skye Terrier, the first mentioned breed having a

smooth, graceful form, erect ears, sharp muzzle and carrying the tail somewhat curved over the back, while the Scotch Terrier has short legs, a short muzzle, and a coarse, wiry coat. The Skye Terrier is also possessed of a coat of coarse, wiry hair, but is distinguished by the extreme shortness of its limbs and the great length of its body. The Terriers are active and intelligent dogs and many of the breeds have a fondness for burrowing, from which habit comes the name of this class. The Bull-terrier is a cross between this breed and the Bull-dog and possesses a large share of the savage instincts of the latter.

In the above brief notice of the several groups or races of dogs, lack of space has prevented a fuller description of the different breeds under each, but enough has been presented to afford a comprehensive idea of the principal breeds now in existence and the position of each under this classification.

The uses to which the different members of this family have been put are varied and numerous. The dog has ministered to the wants of man within the greatest extremes, viz., as an object of worship, and pitted in the amphitheatre and prize ring for the gratification of his perverted and degraded nature. He has been an economic factor of no little importance, serving his master in war, in the chase, in travel as a beast of burden, and as a faithful and competent guardian of his property. Trained to the performance of wonderful feats of endurance and skill he has executed them in a manner to challenge the admiration of all mankind. From time immemorial, he has been chosen as a companion and friend by both civilized and uncivilized man, and the fidelity with which he has filled these sacred relations, has been scarcely less than human, and the member of the genus homo, who possesses the disposition

to wilfully abuse this noble creation, should be regarded with suspicion and justly deprived of the confidence and esteem of his fellowman. M. B. L.

The last session of Congress provided the Department of Agriculture with the means for inaugurating experiment stations in Hawaii and Porto Rico. The Office of Experiment Stations has charge of the work and has already taken the preliminary steps by sending a man to each of the islands to investigate the conditions of affairs and to report upon the feasibility of certain lines of work. In Hawaii the greatest problem is that of irrigation, for in no other place is so much money expended annually for pumping water for irrigation purposes.

Weather Forecasts by Rural Free Delivery.

There is probably no occupation which is so dependent, in its progress, upon the state of the weather than that of farming. The manufacturer who has all his work under roof is not so dependent upon the conditions of the weather as far as the progress of the work is concerned. He knows the number of days he can depend upon for work during the year and also the hours. But with the farmer it is different. He does not know a day ahead to a certainty that he will be able to work in the field the next day. Hence in his uncertainty he must arrange his work that he can keep himself and hired help busy at all times. Now if he can get some idea a day or two ahead as to what the probable conditions will be then his task will be easier. He can use his own judgment as to what the conditions will be, but it is better and much surer to get the forecasts as issued by the U. S. Weather Bureau. The men who give out the forecasts are in a much

better position to forecast the weather than the farmer, as they have more than the local data to work upon. About 80 per cent. or more of these forecasts are verified correctly. This is a much higher per cent. than the farmer himself can attain.

These forecasts are considered of importance by the farmers, as their requests for the daily forecasts to the Weather Bureau officials show. But many of those that do receive them complain because they are received too late, and say that they would be of more service if they could only be received earlier. The establishment of free rural mail routes in this country has partly solved the question. The plan of sending the forecasts cards by these routes was first suggested by Mr. J. Warren Smith, Section Director of the Ohio Climate and Crop Service at Columbus Station of the U. S. Weather, to the Chief of the Bureau who commended it and gave Mr. Smith the permission to try it.

These rural carriers leave the postoffice immediately after the arrival of the principal mails. Mr. Smith's idea as carried out is to telegraph the forecast to the postmaster, or some one at these centers, and they with the logotype outfit and cards furnished them by the Bureau, to stamp the forecasts on cards and then have the carrier deliver them with the mail.

This plan has worked well and requests for the forecasts are on the increase. The Columbus station at present supplies 18 of these rural stations in Ohio. That these forecasts are appreciated can be shown by the fact that at first only a few cards were delivered, but at the present time about 2,000 families (on rural lines) get the forecasts, or an average of something over 100 cards to each route. More stations could be supplied if it was not

for the fact that the carriers leave before the forecasts are made.

The postal authorities are beginning to recognize the needs of the residents of rural districts. There is no why one class of people should be preferred over another when all pay the taxes equally. The rural free delivery has not only shown itself to be practicable as far as delivery of mail, but also financially, as the increase of the postal receipts will show.

The rural free delivery of mail was commenced as an experiment in 1896 by Postmaster-General Wilson, Congress appropriating the money necessary for the trial. The experiment was commenced by establishing 44 routes in the different states and territories, four of which were established in Ohio. These routes have increased until, on November 1, 1897, there were 630 in the United States. In Ohio it is interesting to note that on the same date there were 38 routes and by January 1, 1900, it has increased to 49, and at the present time there are 118 of these routes in Ohio.

First Assistant Postmaster-General Heath, in his report, says: "When I entered this office in 1897 I knew nothing about free rural mail delivery, but an examination of the reports on file led to the conclusion that great possibilities of social, industrial and educational development lies behind the projected extension of postal facilities in rural communities, and that this service could be extended with great benefit to the people and without any serious tax upon the revenues of the government, inasmuch as an increase of postal business had followed the granting of additional postal facilities to every well selected rural route."

Postmaster-General Smith, in his last report, says: "The free delivery of mails in the rural districts has proved to be one of the most important among

recent developments of the postal service, and presents in its possibilities a question of the largest proportions.

He says the benefits accruing from the extension of postal facilities to the rural communities may be summarized as follows:

- (1) Increased postal receipts.
- (2) Enhancement of the value of farm lands reached by rural free delivery. The increase at a moderate estimate being from \$2 to \$3 per acre.
- (3) A general improvement of the condition of the roads traversed by the rural carrier.
- (4) Better prices obtained for farm products by the producer being brought into daily touch with the state of the markets and then being able to take advantage of information heretofore unobtainable.
- (5) Educational benefits conferred by relieving the monotony of farm life through ready access to wholesome literature.

C. N. M.

International Live Stock Exposition.

The management of the Union Stock Yards at Chicago is erecting a building 600 feet long and 100 feet wide to be used as additional space for the International Live Stock Exposition. This building will be built alongside of Dexter Park Amphitheater, which is 600 feet long and 200 feet wide, constructed of brick and steel and containing stall room for about 3,000 animals. The new building is being built for exposition purposes only, and its erection is a strong evidence of what the Exposition will be. Some idea of the magnitude of the Exposition can be found in the fact that there are 2,230 premiums to be awarded and it will take about 750 yards of ribbon for the premiums. There will be, from present indications, more than 10,000 animals, counting all classes in the competition.

The Southwestern Passenger Traffic Bureau has granted a rate of one fare, plus \$2.00, from all points in its territory to the Exposition, and it is confidently expected that the same rate will apply from all the immediate territory. The Exposition will be held at a time when Christmas beef, mutton and pork purchases are made, and with a low railroad rate hundreds of butcher buyers, exporters and other buyers will be attracted to the city. English buyers have already arranged to come to the Exposition for their Christmas supply of beef. The Exposition begins December 1st and holds eight days.

The nearest prototypes of the International Live Stock Exposition are the Royal Shows of York and Smithfield in Great Britain. At the former, which held its 61st annual exhibition this year, there were, including live stock, poultry and farm produce, only 389 classes, while at the International here there are upwards of 600 classes of cattle, sheep, hogs and horses, to say nothing of the side exhibits.

Seven foreign countries will have official representation at the International Live Stock Exposition. The German Government made space reservation last week for a display.

Hon. Chauncey Depew will attend the opening of the Exposition and will deliver an address. As the new Senator is a leading member of the Farmers' Club of that city he is well informed on live stock matters.

In addition to what will be the greatest display of pure bred and royally pedigreed cattle, hogs and sheep ever seen in the world, there will be the choicest collection of fancy fat animals ever known. The draft horse display, from entries already made, will be double the size of anything of its class heretofore shown.

The Agricultural College and Experiment Stations displays at the Interna-

tional Exposition will be the greatest educational feature ever attempted at a meeting of that kind, and the city, as well as those directly interested, can gain valuable information by attending. In addition to the feeding results and feed displays by the Agricultural Colleges, the fine stock breeder will show what good blood means, and the farmer will produce "after taking" living pictures in testimony of the efficacy of good hay and grain, and the butcher, knight of the saw and cleaver, will by block tests verify or disprove the conclusions reached by all the others.

The entire show will be a record breaker. It will be the live stock feature of the 19th century, and will be a fitting wind up of the glorious progress that has been made in the past 100 years.

New Books.

SQUIRRELS AND OTHER FUR BEARERS.
By John Burroughs. Houghton, Mifflin & Co., Boston and New York. Square 12 mo, 149 pp., with 15 drawings. Price, \$1.00.

The book is made up of fifteen chapters, each of which give a short account of a certain class of fur-bearing animals. The accounts are simply and entertainingly written yet accurate in detail, giving the result of years of observation and study in a form calculated to interest boys and girls and to lead them into habits of observation and investigation of the life of nature about them. The book is made especially attractive to children by fifteen drawings in color after the great naturalist Audubon, and a frontispiece from life. The name of John Burroughs is sufficient guarantee for any book of outdoor or nature studies.

PLANT STRUCTURES. By John M. Coulter, head of the Department of Botany, University of Chicago. D. Ap-

pleton & Co., New York. 348 pp.; 289 figures. Price, \$1.20.

This book is designated as a second book of botany and is designed to follow *Plant Relations*, by the same author, which was issued last year. In the former volume plants were considered mainly from the ecological standpoint, while the present volume approaches the subject from the morphological side. Although *Morphology* occupies a larger part of the book, considerable space is devoted to giving a somewhat general view of plants, and two chapters are devoted especially to *Physiology* and *Ecology*. The first twelve chapters present the general story of evolution of plants from the lowest to the highest, while the remaining chapters are supplementary and can be used as time or inclination permits.

The drawings accompanying the text are exceptionally fine and accompanied by full explanations.

CHEESE MAKING. By Prof. John W. Decker, Professor of Dairying, Ohio State University. Agricultural Student Publishing Co., Columbus, O. 100 illustrations; 208 pages.

The author's "*Cheddar Cheese Making*" has met with phenomenal success, having been translated into French and passed through two English editions. Since the last revision, however, much experimental work in cheese making has been done. The result of these experiments have been gathered together and added to the old book, together with additional chapters on the manufacture of Swiss, Limburger, Edam and Cottage cheese. Prof. Decker's long experience in cheese making has made him an acknowledged authority on the subject and no farmer or student of agriculture can afford to do without this book.

SOILING CROPS AND THE SILO. How to cultivate and harvest the crops; how to build and fill a silo, and how to use ensilage. By Thomas Shaw, Professor of Animal Husbandry at the University of Minnesota. Illustrated. 12mo, pp. 364, cloth. Published by Orange Judd Company, New York. Price, \$1.50.

This new book by Prof. Thomas Shaw forms a most appropriate companion to his *Forage Crops*, published last year. It is by far the most original and complete work ever written on the subject of which it treats. The book is divided into two parts, the first of which treats of the growing and feeding of all kinds of soiling crops that have been found useful in any part of the United States or Canada. The discussion is simple, clear and eminently practical. It treats of the climatic and soil conditions to which all these crops are adapted, of their plan in the rotation of, preparing the land for each crop and of sowing, cultivating and feeding the same.

The second part discusses the silo. No treatise on the subject has ever appeared that will approach in simplicity and comprehensiveness the way in which it has been handled by the author. It is not a plea for the silo, as nearly all the publications have been that have heretofore appeared on the subject, but a sensible discussion of the place for the silo, the benefits from soiling crops, the best methods of building the silo, the crops that are suitable for soiling, filling the silo and feeding the silage. No progressive farmer can afford to be without this book and to dairymen it will prove of highest value.

MR. DOOLEY'S PHILOSOPHY. By F. P. Dunne. Illustrated by William Nicholson, E. W. Kemble and F. Oppen. R. H. Russell, New York. Cloth, p. 263. Price, \$1.50.

Mr. Dooley's Philosophy is sure to meet with a cordial reception from those who have been reading the short articles of this gifted author in the press of America and Europe. The present volume is made up largely of the sketches that have lately appeared and which deal with timely topics that have occupied the minds of newspaper readers and statesmen during the year. The author takes occasion in his preface to express his gratitude to the industrious typographer, who has often made two jokes grow where only one grew before.

The book will be read with pleasure by the many who are already acquainted with Mr. Dooley and his philosophical sayings, through the public press.

HOME-FOLKS. By James Whitcomb Riley. The Bowen-Merrill Company, Indianapolis. Red cloth, ornamental, gilt top. Price, \$1.25.

After a silence of four years Mr. Riley has given to the public another volume of poems. The book is made up of entirely new dialect and serious verse, which will be read with delight by the many admirers of this gifted author's literary productions.

Bulletins Received.

U. S. Department of Agriculture, Bureau of Animal Industry, Dairy Division:

Statistics of Oleomargarine, Oleo Oil, and Filled Cheese. By P. A. Pearson, Assistant Chief.

U. S. Department of Agriculture, Division of Chemistry:

The Manufacture of Starch from Potatoes and Cassava. By Harvey W. Wiley, Chief of the Division of Chemistry.

U. S. Department of Agriculture, Bureau of Animal Industry, Dairy Division:

Report upon the Experimental Exports of Butter, 1898-99. By Henry E. Alvord, Chief of Dairy Division.

Ohio State University Bulletin No. 5: Contributions from the Department of Zoology and Entomology. No. 3: The Genus Scaphoideus. By Prof. Herbert Osborn.

Scientific Forestry Investigations.

The United States Forestry Commission is investigating the problem of preserving our forests, from a practical standpoint. It will first make itself familiar with the situation from the lumberman's point of view by studying the present stand of timber, the distribution of the forest types, and the conditions of transportation by rail and water. It hopes then to be able to formulate regulations that will insure the forest, as a whole, from destruction, by the perpetuation of commercially valuable timber and the production of a second crop in the shortest possible time. One of the most important parts of the investigation will be the work on the water supply question, by Mr. F. H. Newall, the Hydrographer of the United States Geological Survey. This part of the work will be carried on in the New York Reserve, where it has long been known that the destruction of the Adirondack forests has greatly affected the flow of the streams.

Mr. Fippin Honored.

Mr. E. O. Fippin, '00, has just been honored by an appointment to a position in the Division of Agrostology of the United States, Department of Agriculture.

Mr. Fippin was very active in college affairs while at O. S. U., and received many honors, all of which he proved himself worthy. It is the earnest desire and belief of all who know him, that he will be equally successful in his new line of work. He left for Washington, D. C., last Wednesday evening to assume his duties in the department. —*Lantern.*

ADVERTISEMENTS.

NEW BOOK ON CHEESE MAKING

BY

PROF. JOHN W. DECKER,

In Charge of the OHIO DAIRY SCHOOL, and for Ten Years in Charge of the Cheese
Work at the WISCONSIN DAIRY SCHOOL AND
EXPERIMENT STATION.

PROF. DECKER'S "CHEDDAR CHEESE MAKING" has had a remarkable career, having been translated into French and passed through two English editions. Much valuable experimental work has been done with cheese in the past five years, and Prof. Decker has gathered this all together and added it to the old book so that it is brought up-to-date.

With the manufacture of Cheddar Cheese has been included the manufacture of Swiss, Brick, Limburger, Edam and Cottage Cheese. The chapters on the Constitution, Secretion and Care of Milk, and the Department of Rennet, are especially strong.

The book is a handsome volume of 208 PAGES, 6x9 INCHES, PRINTED ON FINE ENAMELED PAPER, AND BOUND IN ART CANVAS. Exactly 100 cuts, nearly one-half of which are fine half-tone engravings, have been used to illustrate it.

Such a book should readily sell for \$2.50, but the AGRICULTURAL STUDENT PUBLISHING Co. can send it to you (*postpaid*) for \$1.75, including one year's subscription to the *Agricultural Student*.

Every farmer ought to have this book so that he can know just as well as the cheese maker what is authority on the care of milk, and the value of rich milk for cheese. Address:

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